



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

*[Handwritten signature]*

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/786,081	02/26/2004	Tsuyoshi Sugihara	67161-143	3535

7590 10/28/2004  
McDermott, Will & Emery  
600 13th Street, N.W.  
Washington, DC 20005-3096

EXAMINER

WILSON, ALLAN R

ART UNIT	PAPER NUMBER
----------	--------------

2815

DATE MAILED: 10/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/786,081

Applicant(s)

SUGIHARA, TSUYOSHI

Examiner

Allan R. Wilson

Art Unit

2815

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>0204</u> .  | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Claim Objections*

Claim 5 is objected to because of the following informalities:

Claim 5 recites the limitation “the other portion” in line 5. There is insufficient antecedent basis for this limitation in the claim.

Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-5 are rejected under 35 USC § 102(b) as being anticipated by Bandyopadhyay et al. (“Bandyopadhyay”) U.S. Patent No. 6,130,467.

With regards to claim 1, Bandyopadhyay illustrates in figures 1A-2, particularly figure 2, (entire document) a semiconductor substrate 21 having a trench 21b for said trench isolation that is located in a main surface of said semiconductor substrate; and a buried insulating layer 24 filling the inside of said trench and having its top surface entirely located above the main surface of said semiconductor substrate; a part of said buried insulating layer that protrudes from the main surface of said semiconductor substrate having a projecting portion 22 and 25 which is located on the main surface of said semiconductor substrate and projects outward from a region

Art Unit: 2815

directly above said trench, and said projecting portion having a structure formed of at least two stacked insulating layers.

With regards to claim 2, Bandyopadhyay illustrates in fig. 2 said projecting portion has a structure formed of a first oxide film 22 and a second oxide film 25 that are stacked.

With regards to claim 3, Bandyopadhyay discloses in col. 6, lines 10-17, said projecting portion has a structure formed of an oxide film 22 and a nitride film 25 that are stacked.

With regards to claim 4, Bandyopadhyay illustrates in col. 6, lines 7-25, said projecting portion has a thickness of at least 23 nm and at most 75 nm. Oxide pad layer 22 is 10 nm to 20 nm and spacer 25 has a thickness "h" which is 50 nm to 125 nm. The minimum total would be 60 nm, which is within the range of 23 nm to 75 nm.

With regards to claim 5, Bandyopadhyay illustrates in fig. 2 a gate insulating film 26 formed on the main surface of said semiconductor substrate, wherein

said gate insulating film has its width, defined in a cross section of said semiconductor device, between one portion and the other portion of said buried insulating layer 22, an active region has its width defined in said cross section between one portion and the other portion of said trench 21b, and the width of said gate insulating film is smaller than the width of said active region.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Ashburn (illustrates a STI with a similar structure to the one claimed) and Gardner et al. (illustrates a STI between a pair of low K dielectric structures).

Art Unit: 2815

Field of Search	Date
U.S. Class and subclass: 257/501, 506, 510	October 25, 2004
Other Documentation: None	N/A
Electronic data base(s): EAST (USPAT, US-PGPUB, JPO, EPO, Derwent, IBM TDB)	October 25, 2004

Any inquiry concerning this communication or earlier communications from an examiner should be directed to Primary Examiner Allan Wilson whose telephone number is (571) 272-1738. Examiner Wilson can normally be reached 7:00-4:00 Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (571) 272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Allan R. Wilson  
Primary Examiner  
October 25, 2004